*Georgia Institute of Technology*

# Advanced Clean Room Building

President G. Wayne Clough

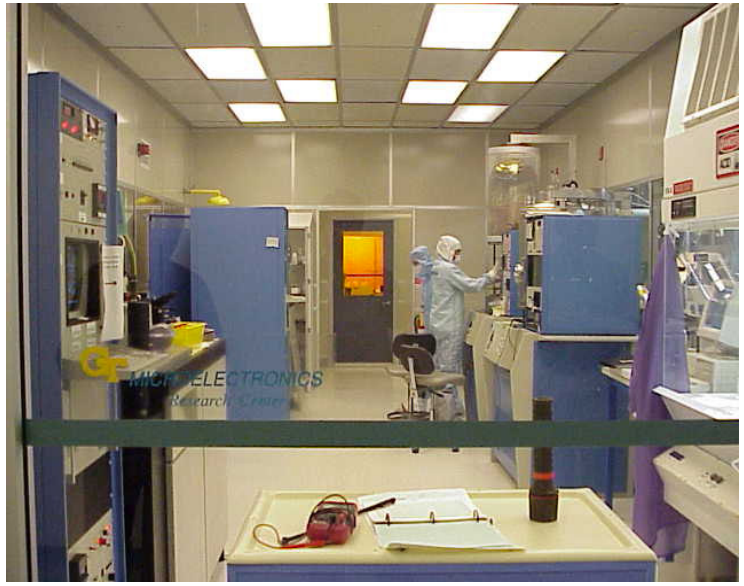
Board of Regents
University System of Georgia

*June 11, 2002*

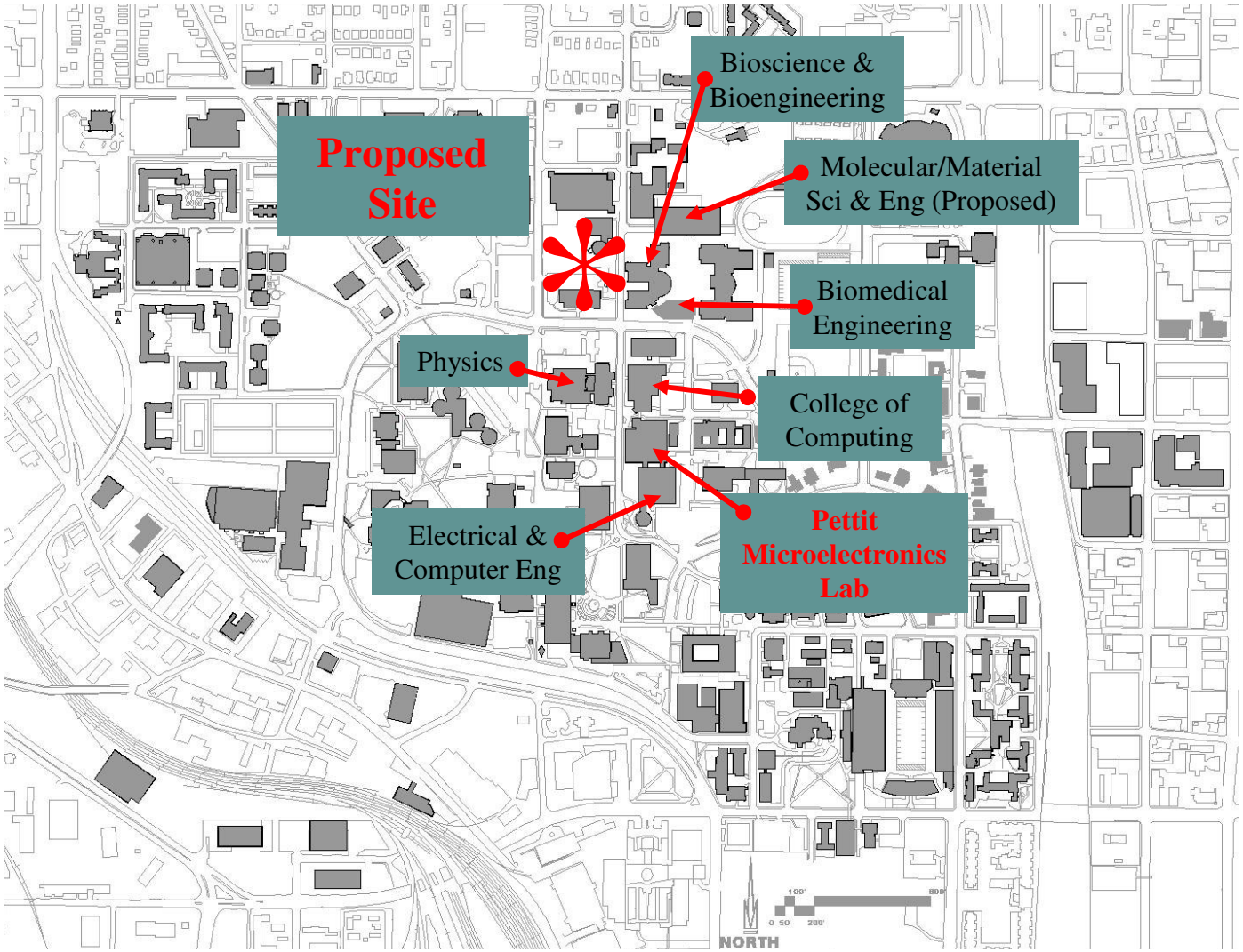
# Proposal:

## *Next Generation Clean Room Building*

- 150,000 gsf facility for ultra-clean research and teaching labs
- Growing leading edge research and instruction *in microelectronics, semi-conductors, materials, medicine and pharmaceuticals, nanotechnology*
- Build upon an earlier State investment to become a National Center of Excellence *in key emerging research areas critical to economic development*



# Proposed Building Site



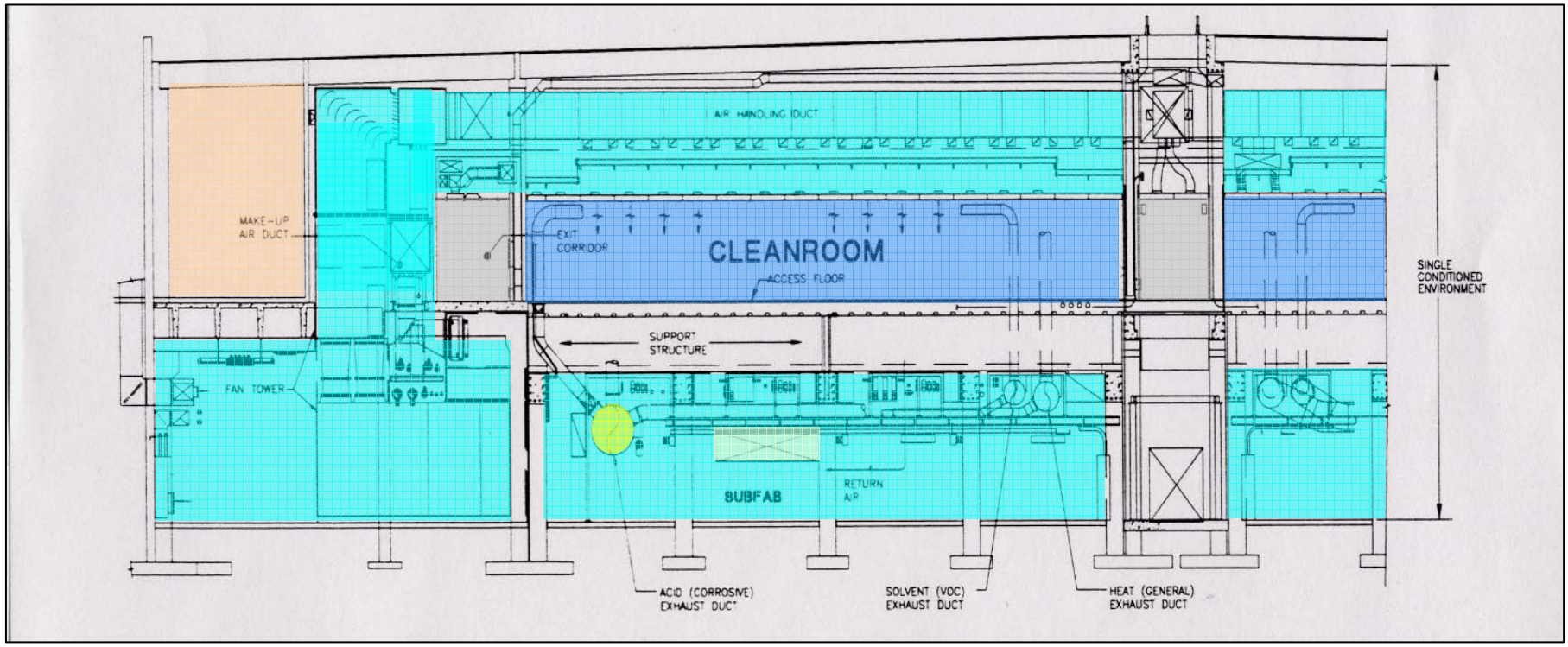
# What is a Clean Room?

- Super-clean environment that controls particle and bio-contamination
- Class 10, 100 & 1,000 research labs

  *Class 100 = 100 particles per cubic foot • a human on average puts out 600,000 particles per minute from skin, hair and breath • a particle is anything less than 0.1 mm*

- Houses sophisticated equipment for research and fabrication in…
  - *Electronics for communications and computing*
  - *Nano-science/engineering*
  - *Pharmaceuticals and medical devices*
  - *Micro- and nano- mechanical and electrical devices*

# What is a Clean Room?



# Historical Perspective – Pettit Microelectronics Building

- A seminal strategic investment (1989) during the Joe Frank Harris administration, enabling Georgia Tech to:
  - Recruit pre-eminent scholars and researchers
  - Create national centers of excellence in semi-conductor research
  - Facilitate interdisciplinary, multi-university, and university/industry collaborations
  - Prepare technology leaders
  - Become top ranked engineering program

# Historical Perspective – Pettit Microelectronics Building

- Major contributions to economic development of the state of Georgia and its initiatives (e.g. Yamacraw)
- Supports micro-scale research with annual expenditures of $25 million
- Operates at over 150% of capacity
- Cannot support nano/ molecular scale research

# The Next Strategic Imperative. .

- Materials with 10 times the strength of steel and a fraction of the weight
- Computer speeds that make tortoises of the Pentium
- Bio-medical implants to detect tumors the size of just a few cells
- Processing of semi-conductors without water
- Self-healing alloys, fibers, skin and other tissues
- Custom designed drugs, cures for genetic diseases

# Why now?

- *New levels of technology to support these* **emerging areas critical to economic development** *initiatives*
- **Competing states and universities investing, too -** *U. of California, MIT, Berkeley, U. of Michigan, Purdue, U. of Illinois, …*
- **Growing demand and sophistication** *beyond the capacity of existing clean rooms*
- **Supports research needs** *of Yamacraw, biotechnology, cancer initiatives and USG institutions*
- *Very strong participation from* **industry partners**

# Industry Partners

## Craig Barrett, CEO of Intel . . .

*"This program [the interconnect program in MiRC] will help keep our country, economy and industry strong"*

Major Companies . . .

Cypress | Novellus Systems | Boeing | IBM | Intel

General Electric | Motorola | Applied Materials

Bell South | Air Products and Chemicals | Siemens

Emerging Companies . . .

Microcoating | Verifiber | Cirrex | Movaz | Cardiomems

Quanitiera | Redeon | Xilinix | Ciena | MICRON Technology

# What Others Have to Say…

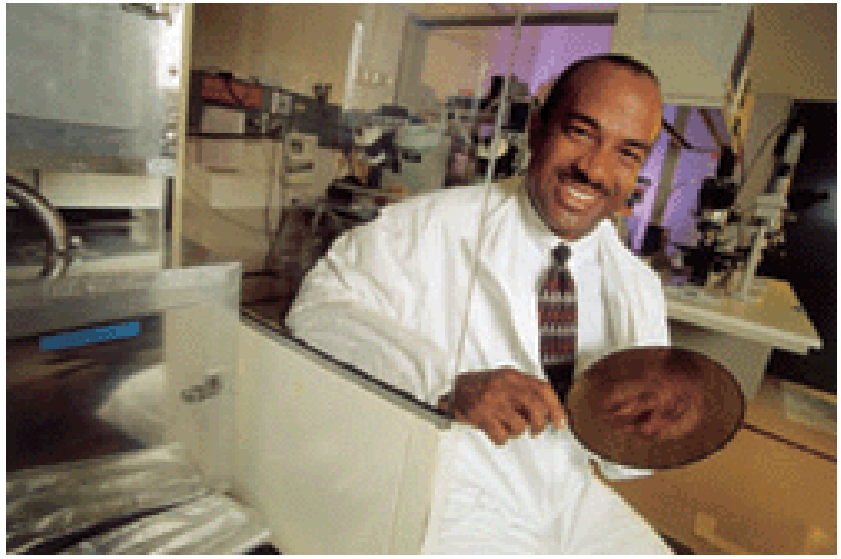
**Michael Johns, EVP/Health Affairs, Emory. . .**
*"Advances we are looking for in the detection and treatment of diseases can only made possible by such technologies and facilities"*

**Steve W. Chaddick, Senior Vice President, CIENA Corp. . .**
*"Georgia Tech has received recognition in this arena (micro-electronics and electro-optics) with academia and industry and in order to achieve excellence, newly created facilities must be put into place on campus"*

**Thomas J. Quigley, Senior Director, Broadcom Corp. . .**
*"Without more clean room space, Tech will lose its ability to compete- not from lack of new ideas or excellent research, but from the inability to deliver the technology in a usable way "*

# National Center of Excellence for Micro- & Nano-Research and Fabrication

- Concentrate Class 10, 100 and 1,000 clean rooms in single facility
- National resource *for industry*
- *A* hub for faculty researchers from USG *and others in the south*
- Build upon prior investments
- *An* "unfair" advantage *for the State's economic development*



# The New Clean Room Facility Will . . .

- *Extend university and state initiatives into* **molecular and nano-scale** *activities*
- *Support molecular/nano-scale* **research** *with annual expenditures to exceed* **$60 million**
- *Support research of* **120 faculty** *members,* **600 graduate students,** *and lab instruction for our* **largest undergraduate population**
- *Be a catalyst for university*–**industry collaboration**
- *Prepare* **next generation** *technology leaders*
- *Contribute to the continuing* **economic development** *of Georgia*

# Advanced Clean Room Bldg Proposal

*project scope*

| | |
|---|---|
| Total Space – Gross $Ft^2$ | 150,000 |
| Building/Infrastructure $Ft^2$ | 80,000 |
| Assignable $Ft^2$ | 70,000 |
| *Cleanroom Suites* | *30,000* |
| *Cleanroom Set-up and Operations Space* | *20,000* |
| *Research Laboratory Space* | *20,000* |

# Proposed Building
*project scope*

| | |
|---|---|
| **Total project cost** | **$80 million** |
| *Site Preparation* | *8 million* |
| *Clean Room Building* | *$72 million* |

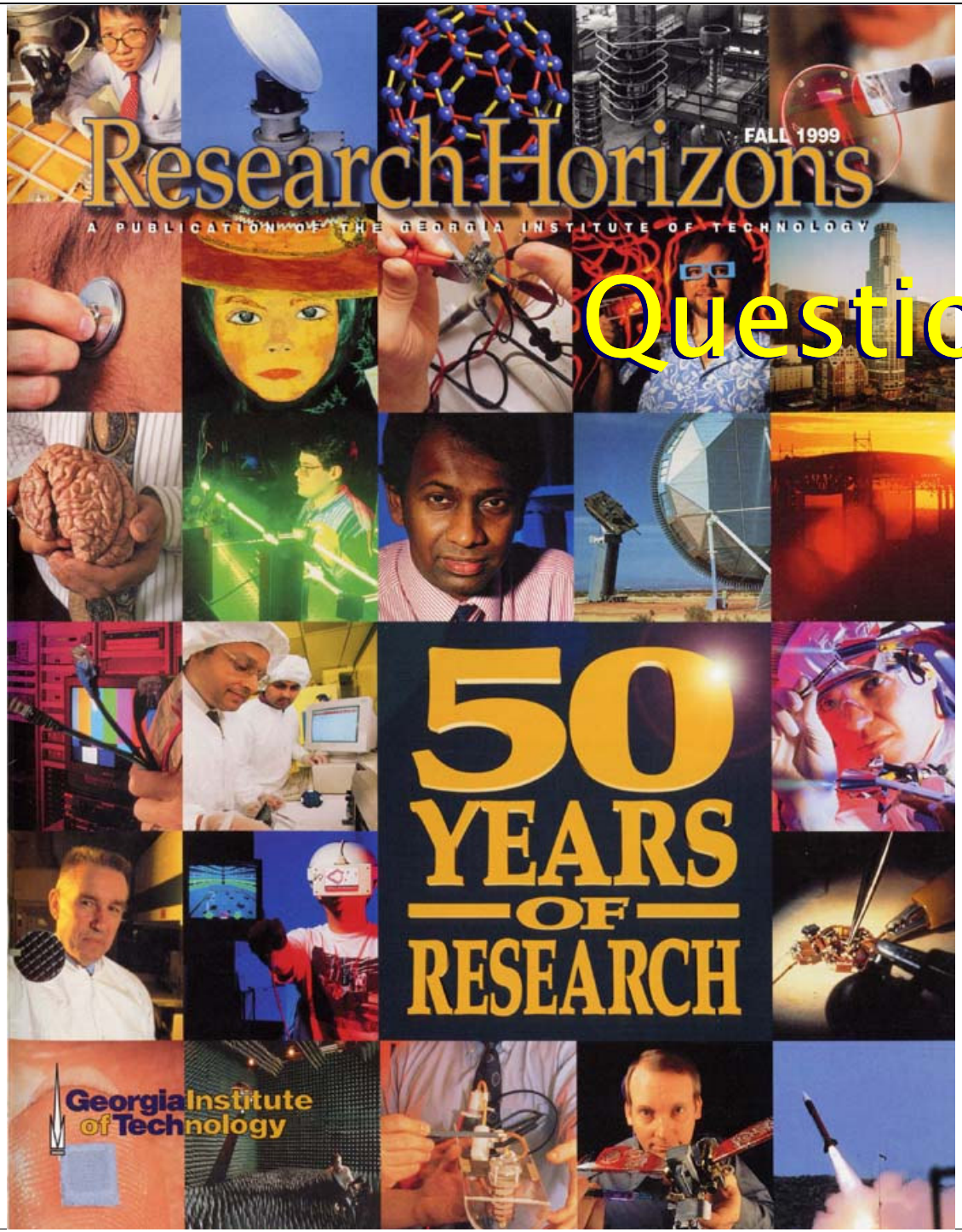
**Proposed source of funds:**

| | |
|---|---|
| *State Funds* | *$45 million* |
| *GT/Private* | *$35 million* |

# Consistent with BOR Strategic Plan

- **Developing graduates**… *with defined skills and knowledge, capable of leadership, creative endeavors, and contributing citizenship*
- **Improve continuously the quality** *of curricula, research activities, and international opportunities*
- **Emphasizing the recruitment, hiring, and retention** *of the best possible faculty, staff and administration*
- **Accelerated economic development** *by providing needed graduates, appropriate academic programs, and expanding marketing of the System…as an economic asset of the state*
- *Providing and maintaining* **superior facilities,** *funded by innovative mechanisms which increase the speed with which they are usable*
- **Maximizing cooperation** *with other state agencies, etc.*


Summary…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Questions?